

**CLAIMS**

What is claimed is:

1. A light transistor system, comprising:
  - a) an image transistor, having a liquid crystal modulator, configured to amplify a light signal using amplification energy from a light source; and
  - b) a coolant passageway, extending through the image transistor, configured to receive a flow of coolant therethrough, to allow cooling of the image transistor.
- 5 2. A light transistor system in accordance with claim 1, further comprising a heat-radiating device, in fluid communication with the coolant passageway, configured to cool the coolant.
- 10 3. A light transistor system in accordance with claim 2, wherein the coolant passageway comprises a loop, and is configured such that the coolant circulates through the image transistor and the heat-radiating device by convection.
- 15 4. A light transistor system in accordance with claim 2, further comprising a pump, in fluid communication with the coolant passageway and the heat-radiating device, configured to pump the coolant through the coolant passageway and the heat-radiating device.
- 20 5. A light transistor system in accordance with claim 4, wherein the pump is configured to provide a laminar flow of coolant through the coolant passageway.
6. A light transistor system in accordance with claim 1, wherein the light signal comprises a light image.
- 25 7. A light transistor system in accordance with claim 1, wherein the image transistor further comprises:
  - a) a photoconductor, having a charge separation layer and a charge generation layer, disposed behind the modulator, and configured to receive a light image from an image source;
  - 30 b) a reflective surface, having a light blocking layer, disposed between the modulator and the photoconductor, configured to reflect high-power light energy transmitted through the modulator; and

- c) electrodes, disposed near the modulator, and configured to create an electrical field therearound, whereby the characteristics of the light image received by the photoconductor are transferred to the high power light energy by the modulator, to produce a high power light signal having the characteristics of the low power light image.

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8. A light transistor system in accordance with claim 1, further comprising:

- a) a photoconductor, associated with the image transistor and disposed behind the liquid crystal modulator;
- b) a high-power light source, projected onto a front side of the image transistor, so as to impinge upon the liquid crystal modulator; and
- c) a low-power light signal source, projected onto a back side of the image transistor, so as to impinge upon the photoconductor.

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10. A light transistor system, comprising:

- a) an image transistor, having a front side, a back side, a liquid crystal modulator, and a photoconductor, and configured to amplify a light signal using amplification energy from a light source;
- b) a high-power light source, aimed at the front side of the image transistor, so as to impinge upon the liquid crystal modulator;
- c) a low-power image source, aimed at the back side of the image transistor, so as to impinge upon the photoconductor;
- d) a coolant passageway, extending through the image transistor, and having coolant therein; and
- e) a radiator, in fluid communication with the coolant passageway, configured to remove thermal energy from the coolant, so as to cool the image transistor.

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11. A light transistor system in accordance with claim 10, further comprising a pump, in fluid communication with the coolant passageway and the radiator, configured to pump coolant through the coolant passageway and the heat-radiating device.

12. A light transistor system in accordance with claim 10, wherein the coolant passageway is disposed adjacent the back side of the image transistor.

13. A light transistor system in accordance with claim 10, wherein the coolant passageway is disposed adjacent the front side of the image transistor.

14. A light transistor system in accordance with claim 10, wherein the high-power light source is selected from the group consisting of a laser light source and an arc lamp.

10 15. A light transistor, comprising:

- a) a liquid crystal modulator;
- b) a photoconductor, disposed rearwardly of the modulator;
- c) a reflective surface, disposed between the modulator and the photoconductor;
- d) electrodes, disposed near the modulator, configured to create an electrical field therearound, such that the characteristics of a low-power light image projected onto the photoconductor are transferred to a higher-power light beam projected onto the modulator and reflected off of the reflective surface; and
- e) a coolant passageway, configured to pass a laminar flow of coolant near the modulator.

20 16. A light transistor in accordance with claim 15, wherein the coolant passageway is disposed rearwardly of the photoconductor.

25 17. A light transistor in accordance with claim 15, wherein the coolant passageway is disposed forwardly of the modulator.

18. A light transistor in accordance with claim 15, wherein the coolant passageway is disposed rearwardly of the modulator.

30 19. A light transistor in accordance with claim 15, further comprising a front glass disposed forwardly of the liquid crystal modulator, and a rear glass disposed rearwardly of the photoconductor, the low-power image source being projected through the rear glass, and the higher-power light beam being projected through the front glass.

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20. A light transistor in accordance with claim 15, wherein the electrodes comprise transparent electrodes, and are disposed on opposing sides of the liquid crystal modulator.